

West Nile Virus and other Mosquito Borne Viruses in Virginia in 2003

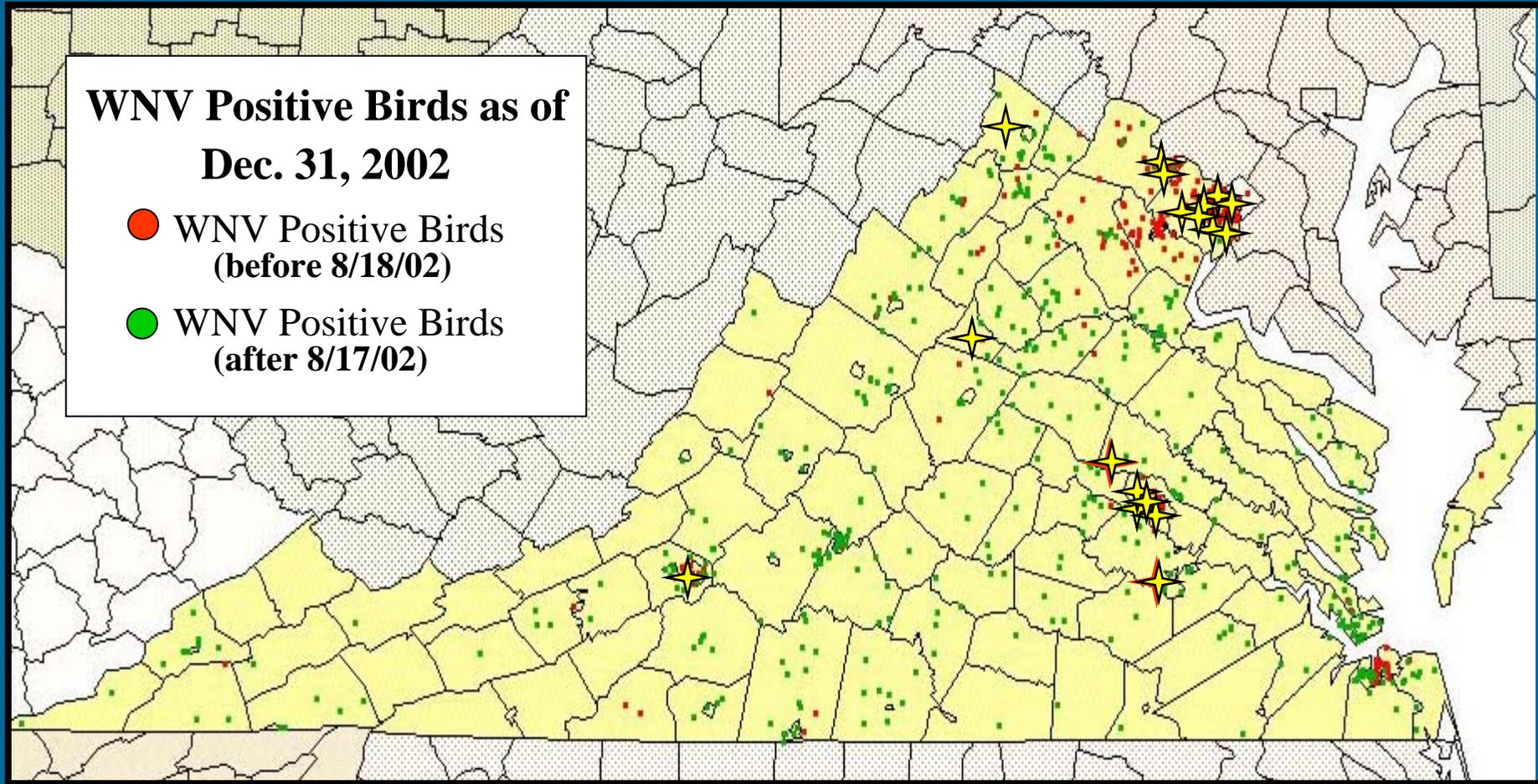
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Public Health Entomologist
VDH-Office of Epidemiology



Virginia WNV Positive Totals, 2002 and 2003:

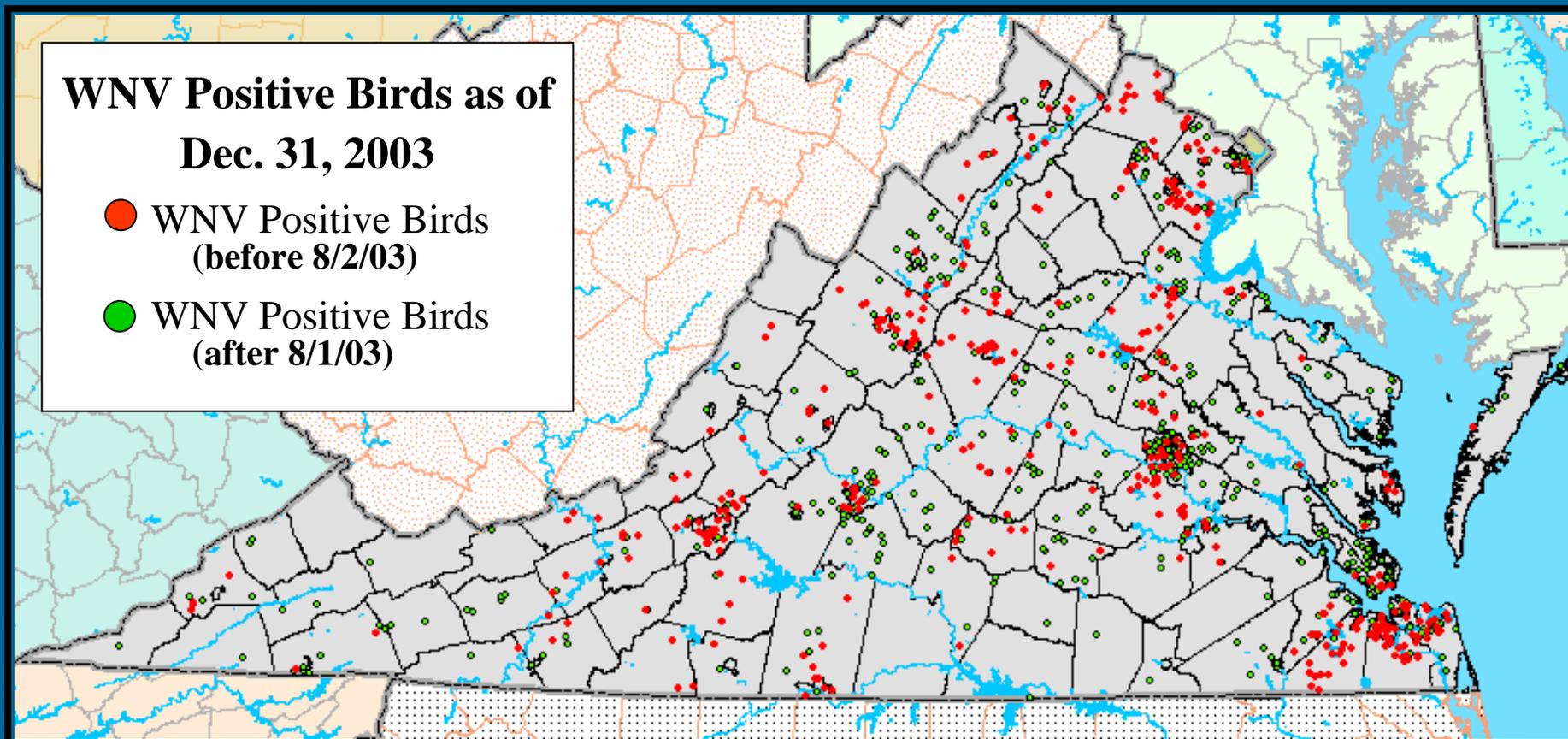
	2002	2003
1. Humans:	29 cases (2 deaths)	24 cases (1 death)
2. Birds:	932	1,041
3. Sentinel Chickens:	6 flocks 10 birds	21 flocks 54 birds
4. Horses:	48	234
5. Mosquito Pools:	223	432

Spatial and temporal distribution of WNV positive birds in Virginia in 2002; mid-August cut off date between early and late birds. .

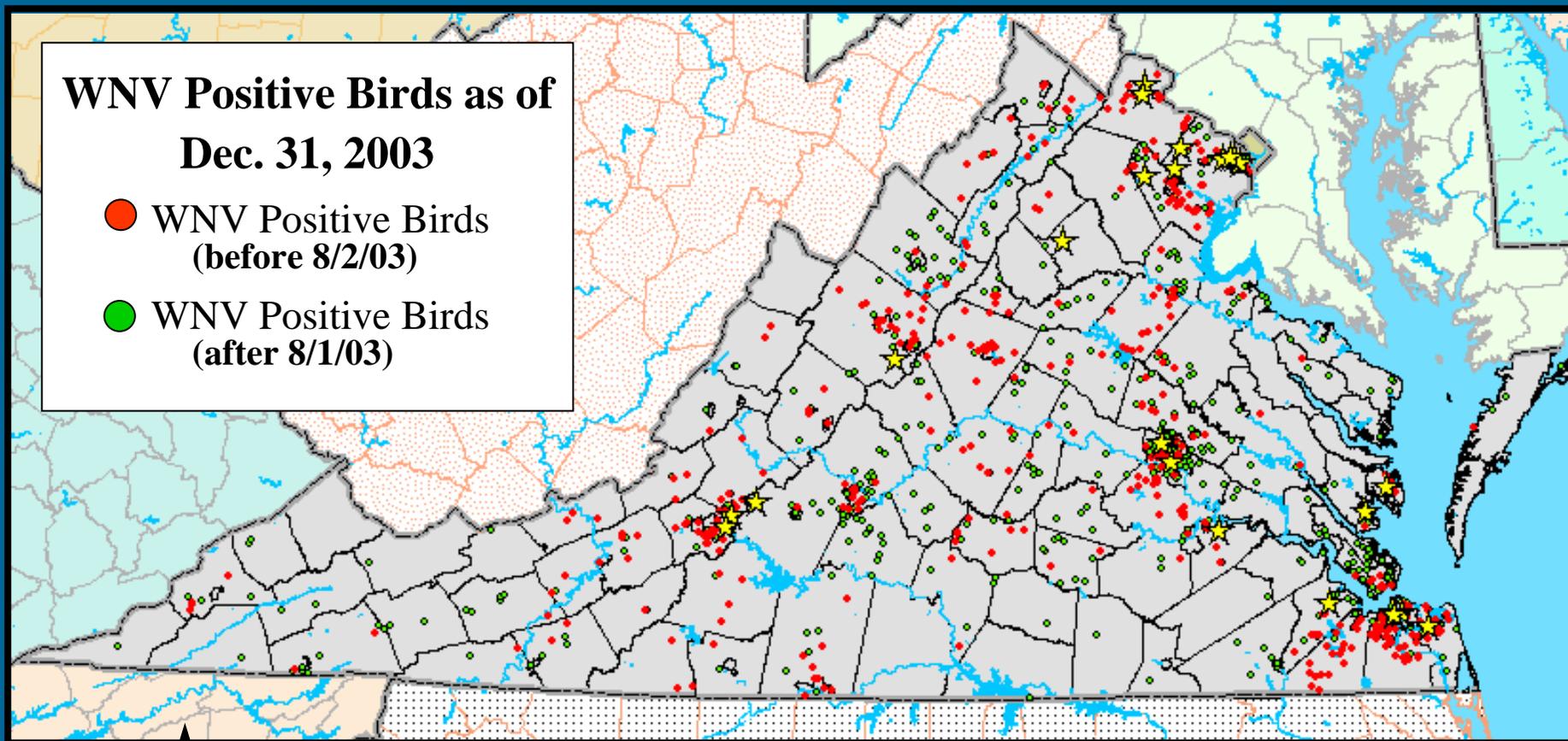


★ Human WNV Cases (29 total cases as of Dec. 31, 2002)

Spatial and temporal distribution of WNV positive birds in Virginia in 2003; early-August cut-off date between early and late birds.

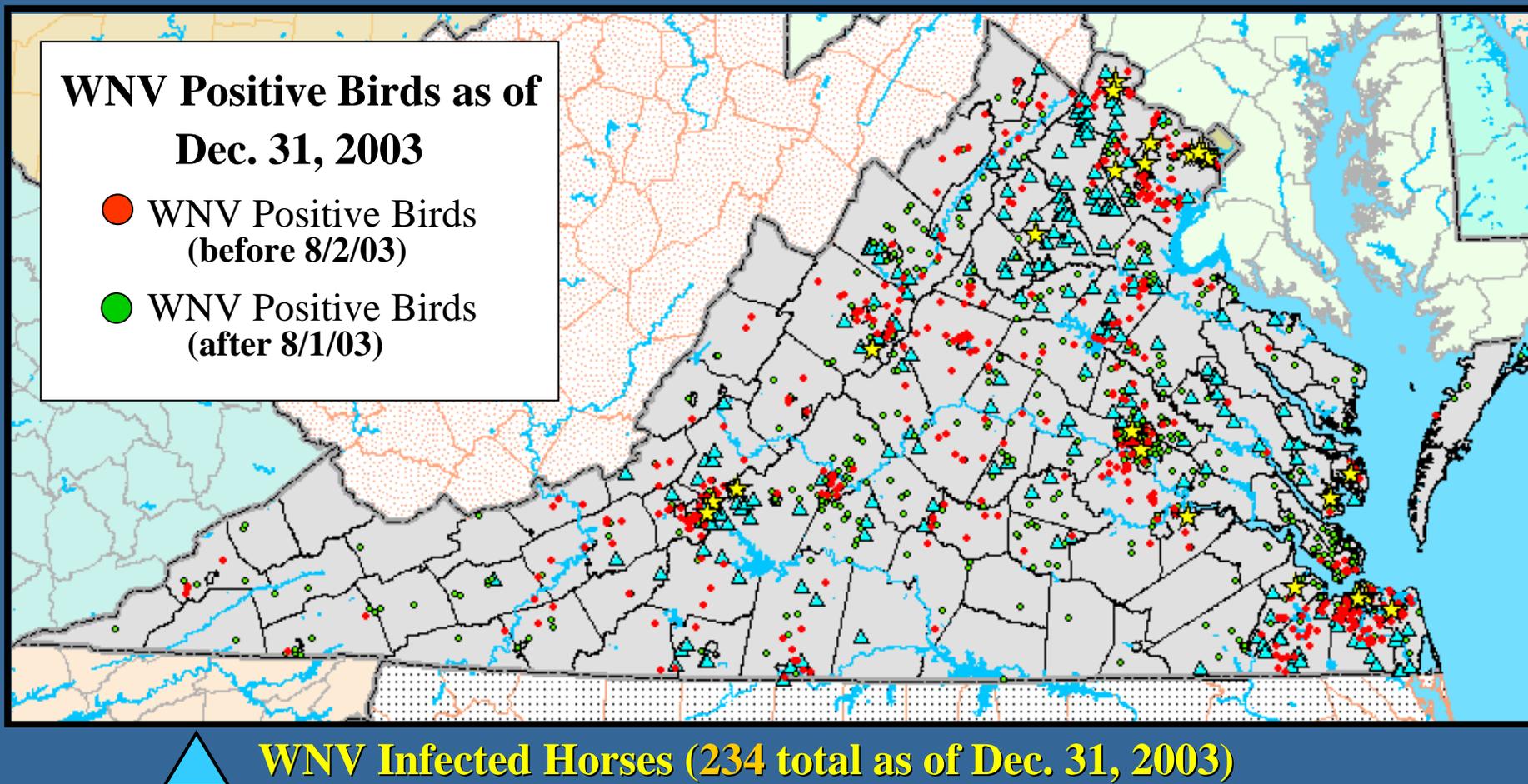


Spatial and temporal distribution of WNV positive birds in Virginia in 2003; early-August cut off date between early and late birds.

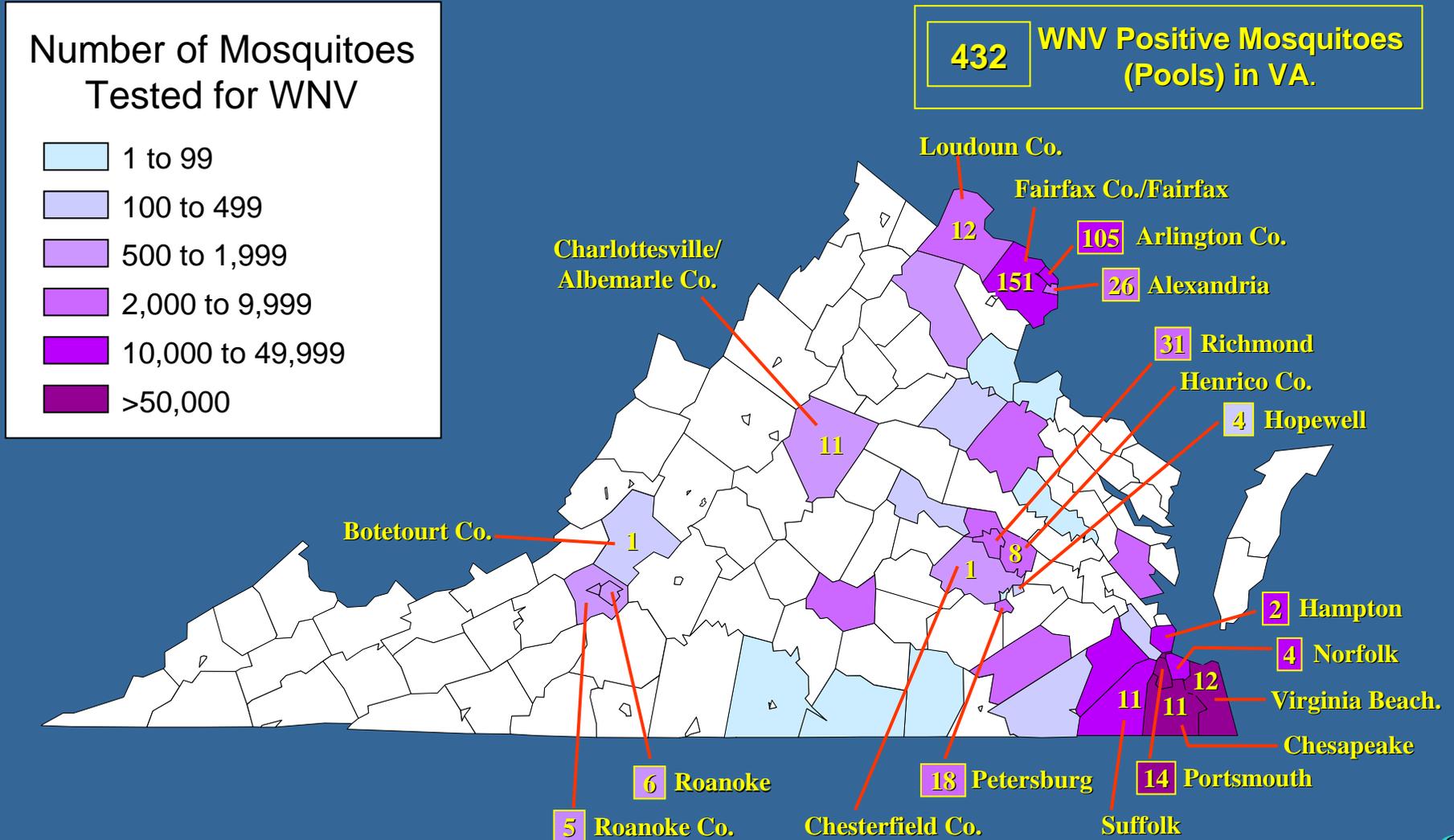


Human WNV Cases (24 total cases as of Dec. 31, 2003)

Spatial and temporal distribution of WNV positive birds in Virginia in 2003; early-August cut off date between early and late birds.



WNV Mosquito Surveillance Efforts, by Jurisdiction, in Virginia in 2003; WNV Positive Mosquitoes found



A Total of 351,405 Mosquitoes were Tested for WNV in 2003; 434 Pools Tested WNV Positive.

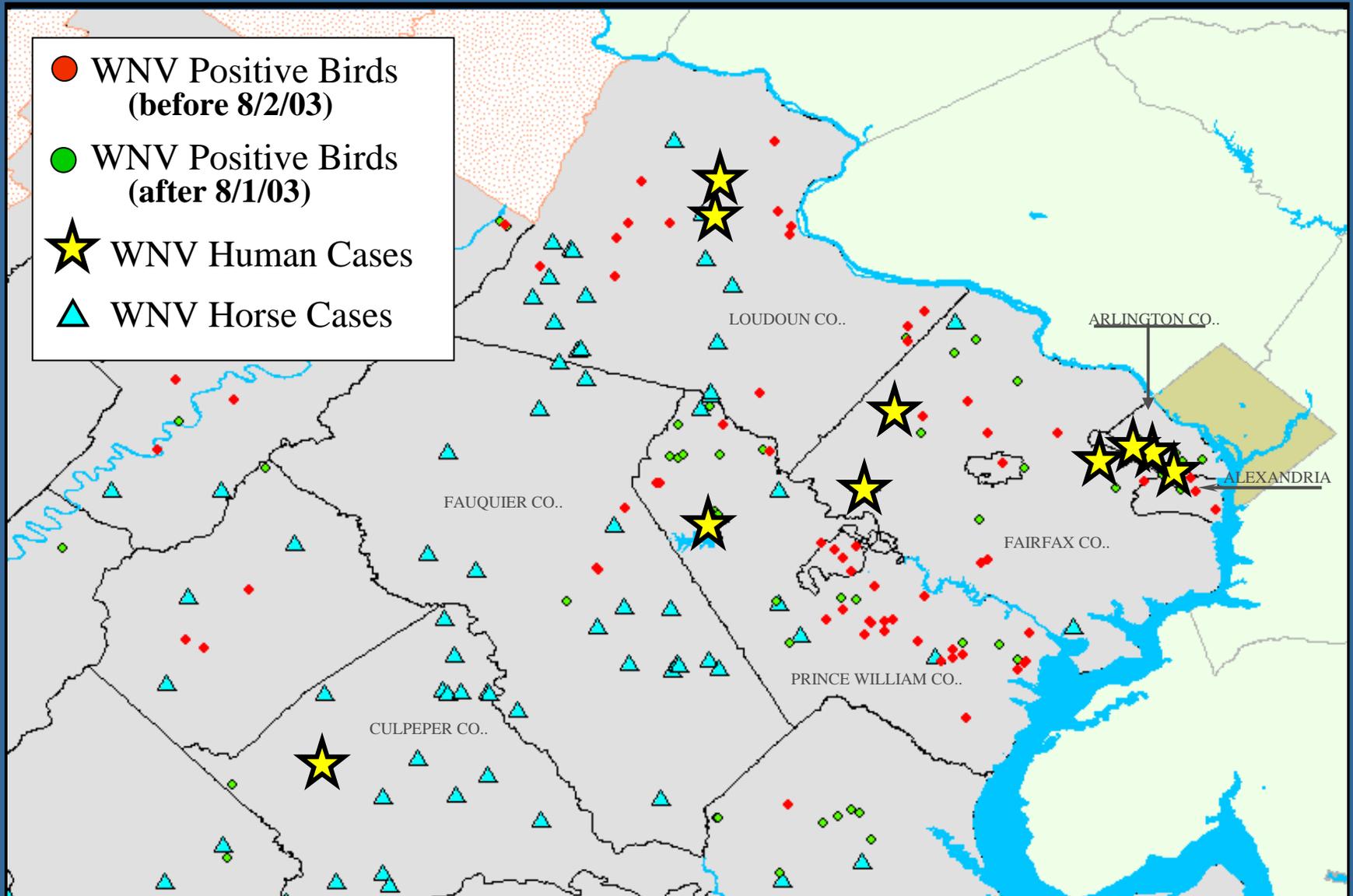
SPECIES	NUMBER TESTED	POSITIVE POOLS
<i>Cs. melanura</i>	69,681	20
<i>Cx. salinarius</i>	65,939	21
<i>Oc. canadensis</i>	37,464	0
<i>Cx. pipiens</i>	36,211	285
<i>An. crucians</i>	34,278	0
<i>Ae. vexans</i>	28,642	2
<i>Cx. restuans</i>	25,214	72
<i>Ae. albopictus</i>	10,757	4
<i>Oc. sollicitans</i>	7,922	0
<i>An. crucians/bradleyi</i>	4,488	0
<i>Cx. erraticus</i>	4,355	1
<i>Oc. taeniorhynchus</i>	4,320	0
<i>Ps. ferox</i>	2,578	0
<i>Oc. atlanticus/tormentor</i>	2,303	0
<i>An. quadrimaculatus</i>	2,136	0
<i>An. punctipennis</i>	2,124	0
<i>Oc. triseriatus</i>	1,610	0
<i>Cx. pipiens/restuans</i>	1,038	9

SPECIES	NUMBER TESTED	POSITIVE POOLS
<i>Cq. perturbans</i>	845	0
<i>Ps. columbiae</i>	814	0
<i>Oc. infirmatus</i>	780	0
<i>Oc. trivittatus</i>	383	0
<i>Oc. sticticus</i>	301	0
<i>Oc. japonicus</i>	21	0
<i>Ur. sapphirina</i>	14	0
<i>Cx. spp.</i>	5,099	18
Unidentified Mosquitoes	1,232	0
<i>An. spp.</i>	388	0
<i>Ae. spp</i>	368	0
TOTAL	351,405	432

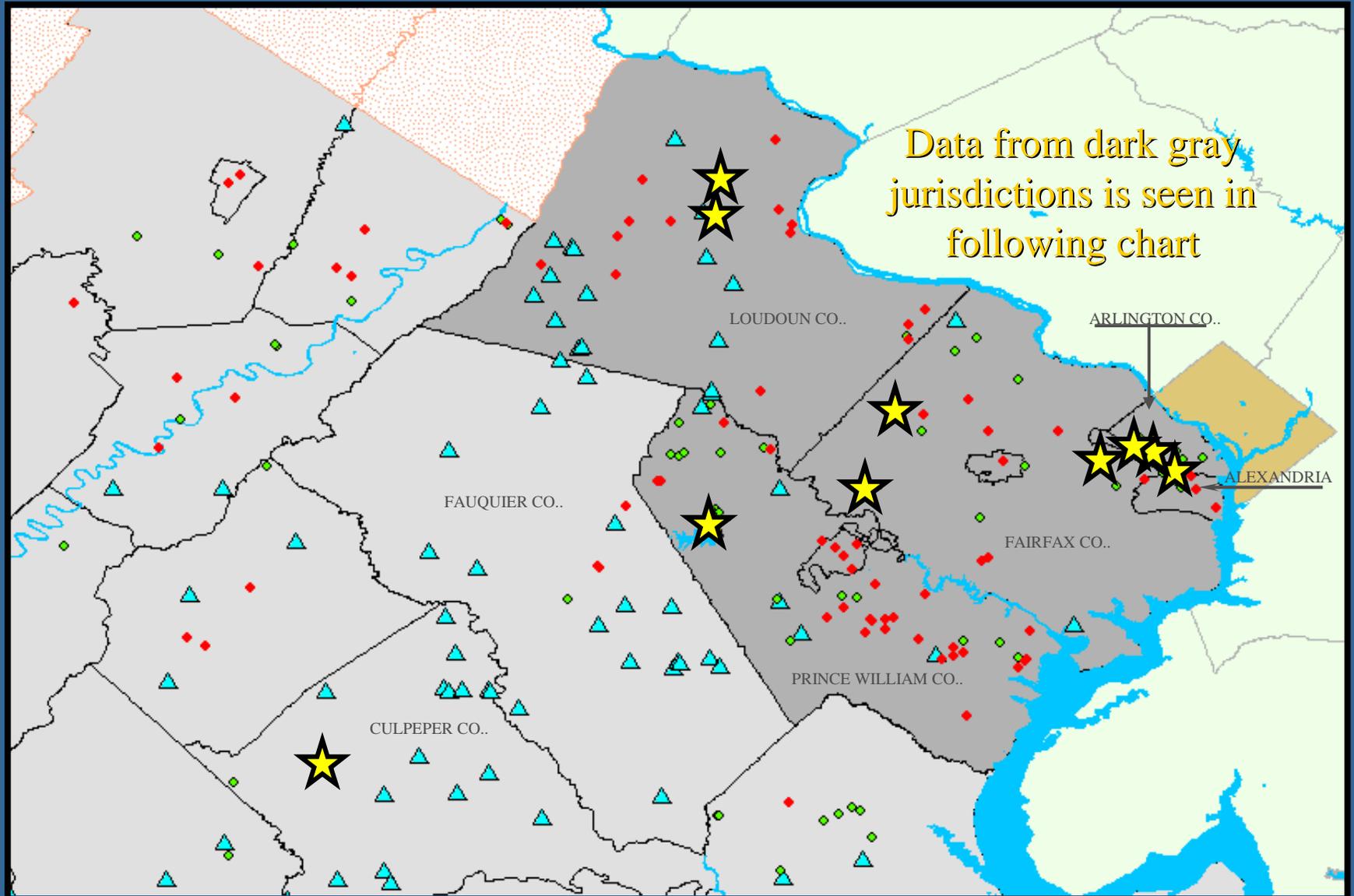
WNV Positive Mosquito Species in 2003:

Mosquito Species	Positive Pools	Mosquitoes Tested	Number Tested per Positive
<i>Culex pipiens</i>	285	35,067	123
<i>Culex restuans</i>	72	20,364	282
<i>Culex salinarius</i>	21	59,545	2,835
<i>Culiseta melanura</i>	20	68,200	3,410
<i>Culex spp.</i>	18	4,353	241
<i>Culex pipiens/restuans</i>	9	757	84
<i>Aedes albopictus</i>	4	9,061	2,265
<i>Aedes vexans</i>	2	24,188	12,094
<i>Culex erraticus</i>	1	2,639	2,639

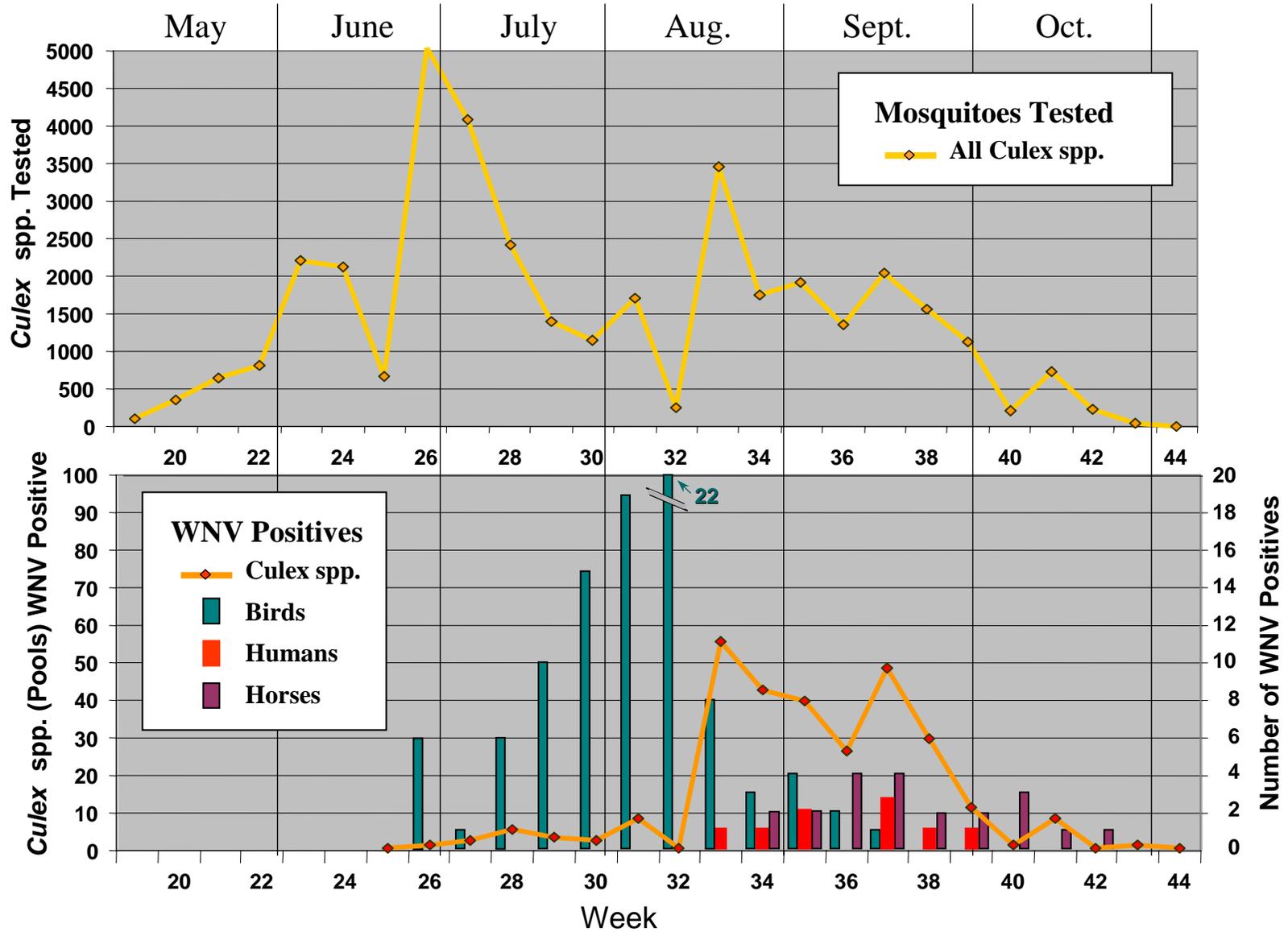
WNV in Birds, Humans and Horses in Northern VA in 2003.



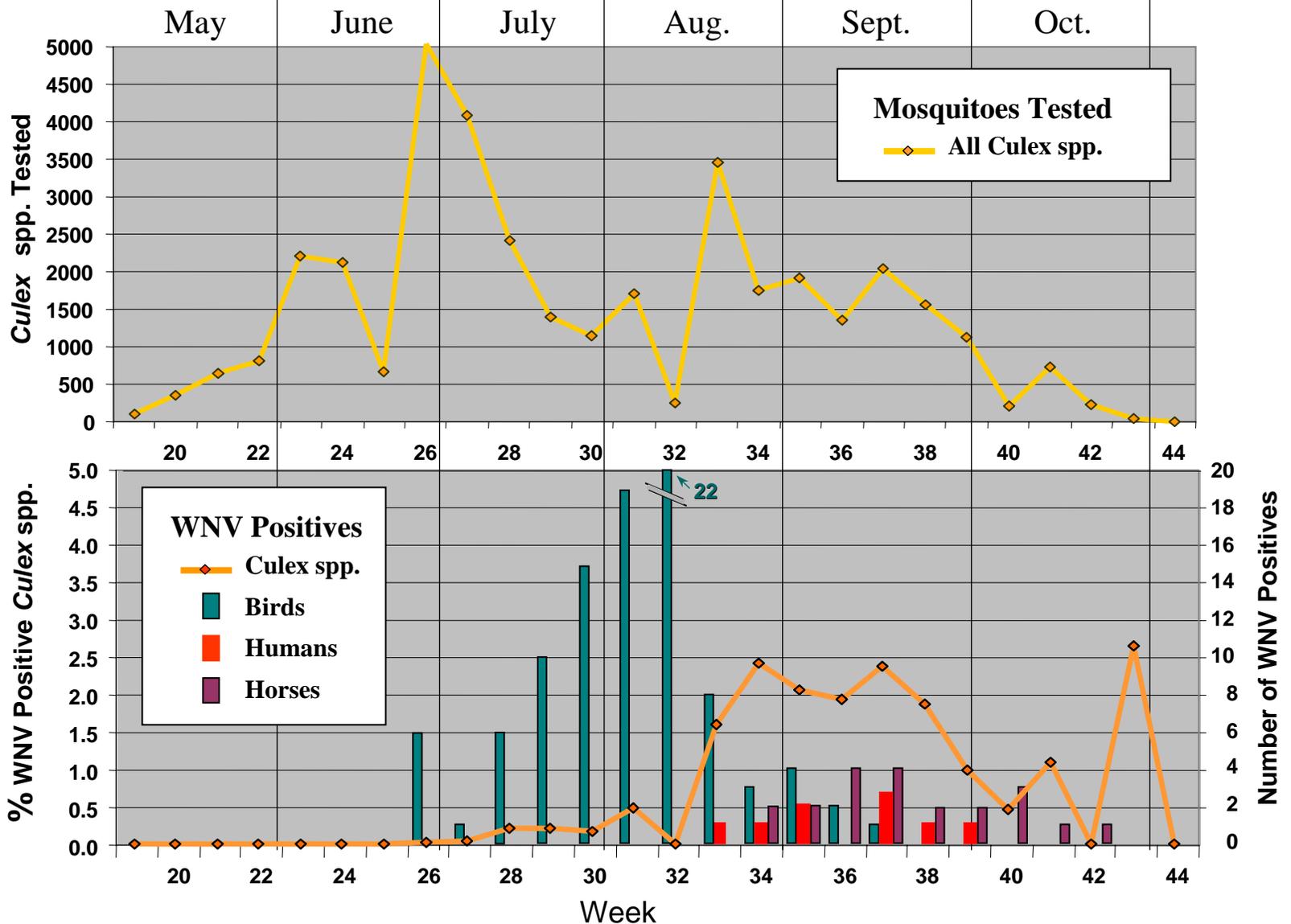
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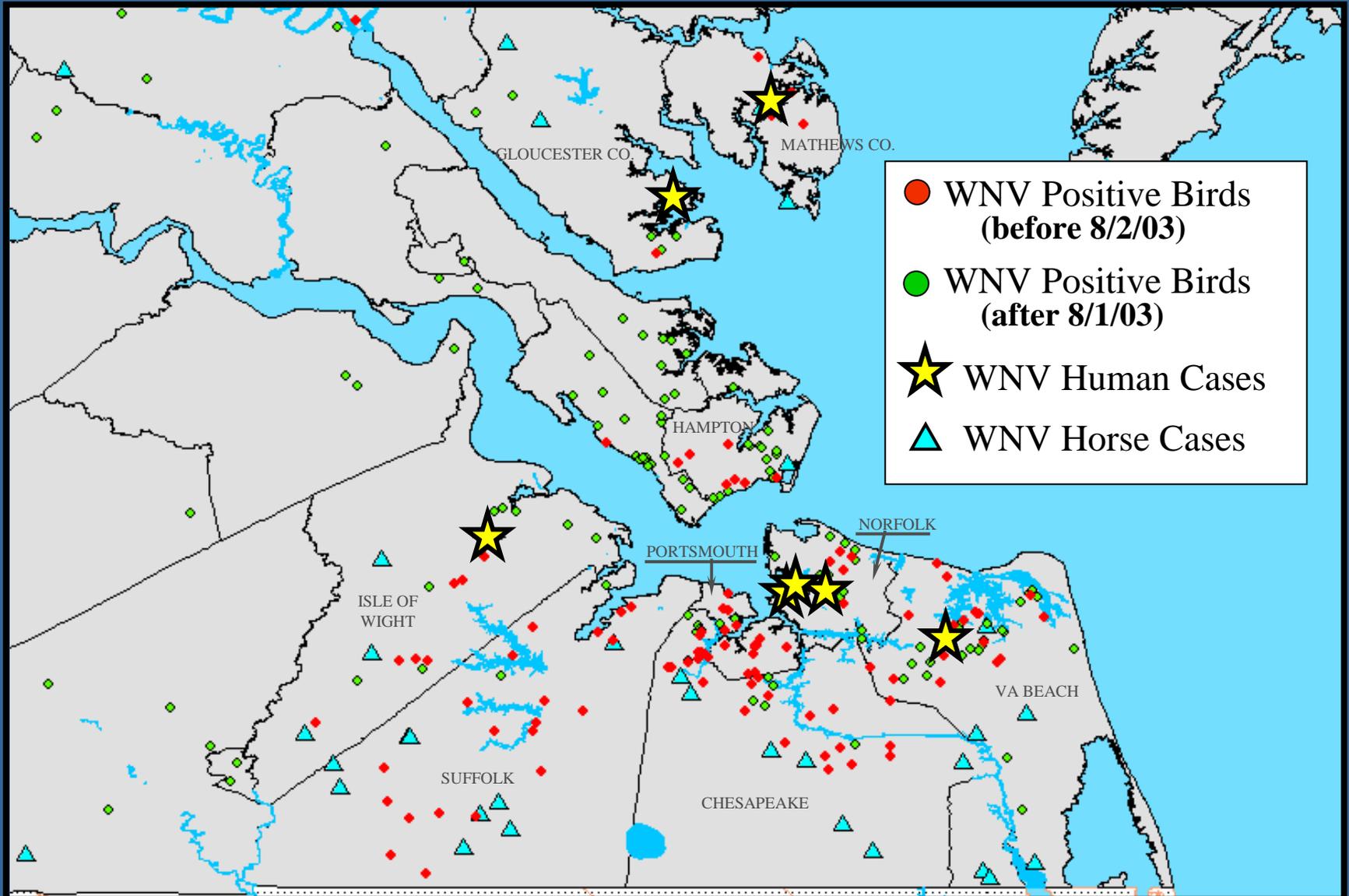
WNV Activity in Northern VA (Alexandria, Arlington Co., Fairfax Co., Loudoun Co. and Prince William Co.) During the 2003 Season.



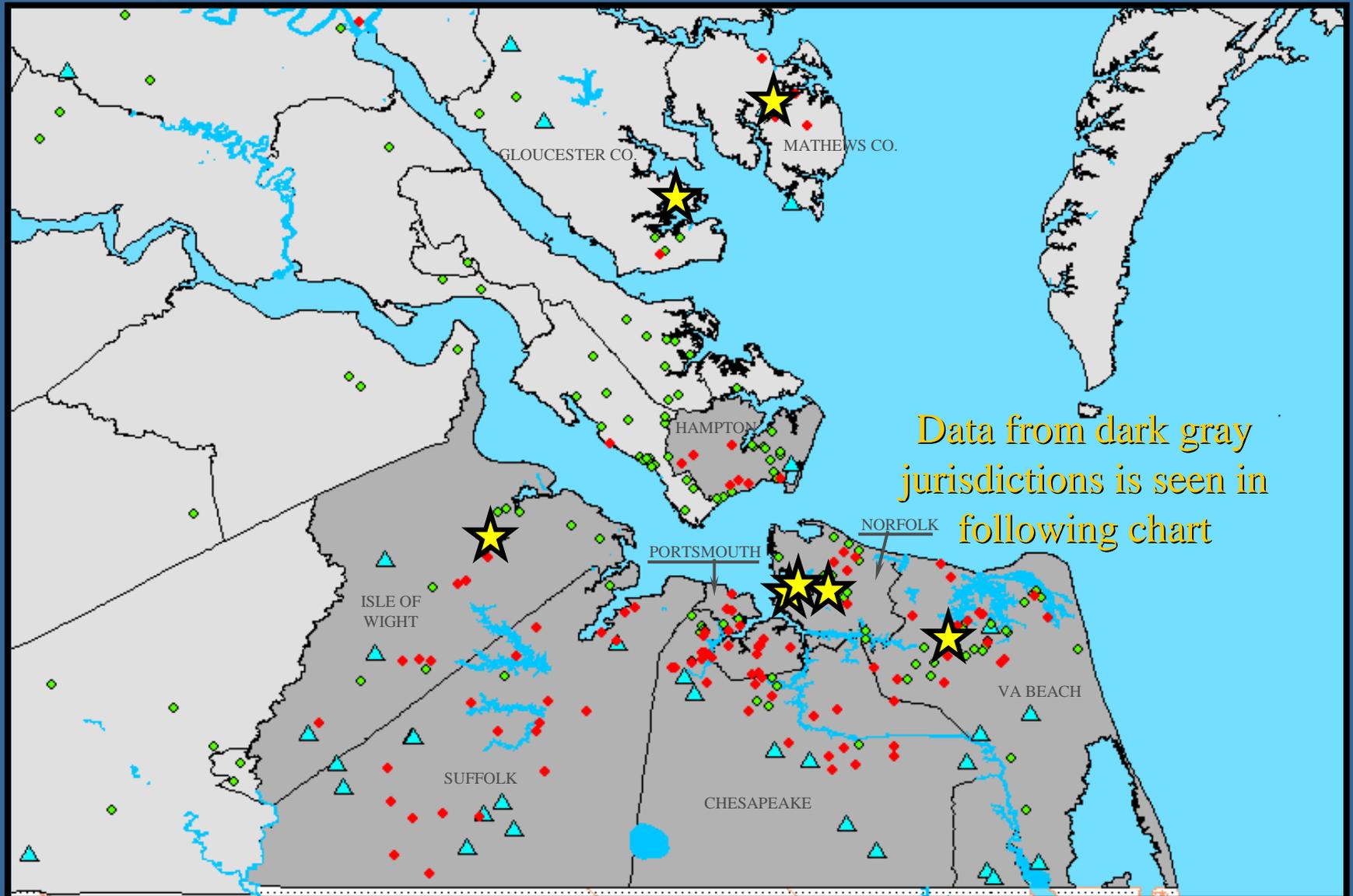
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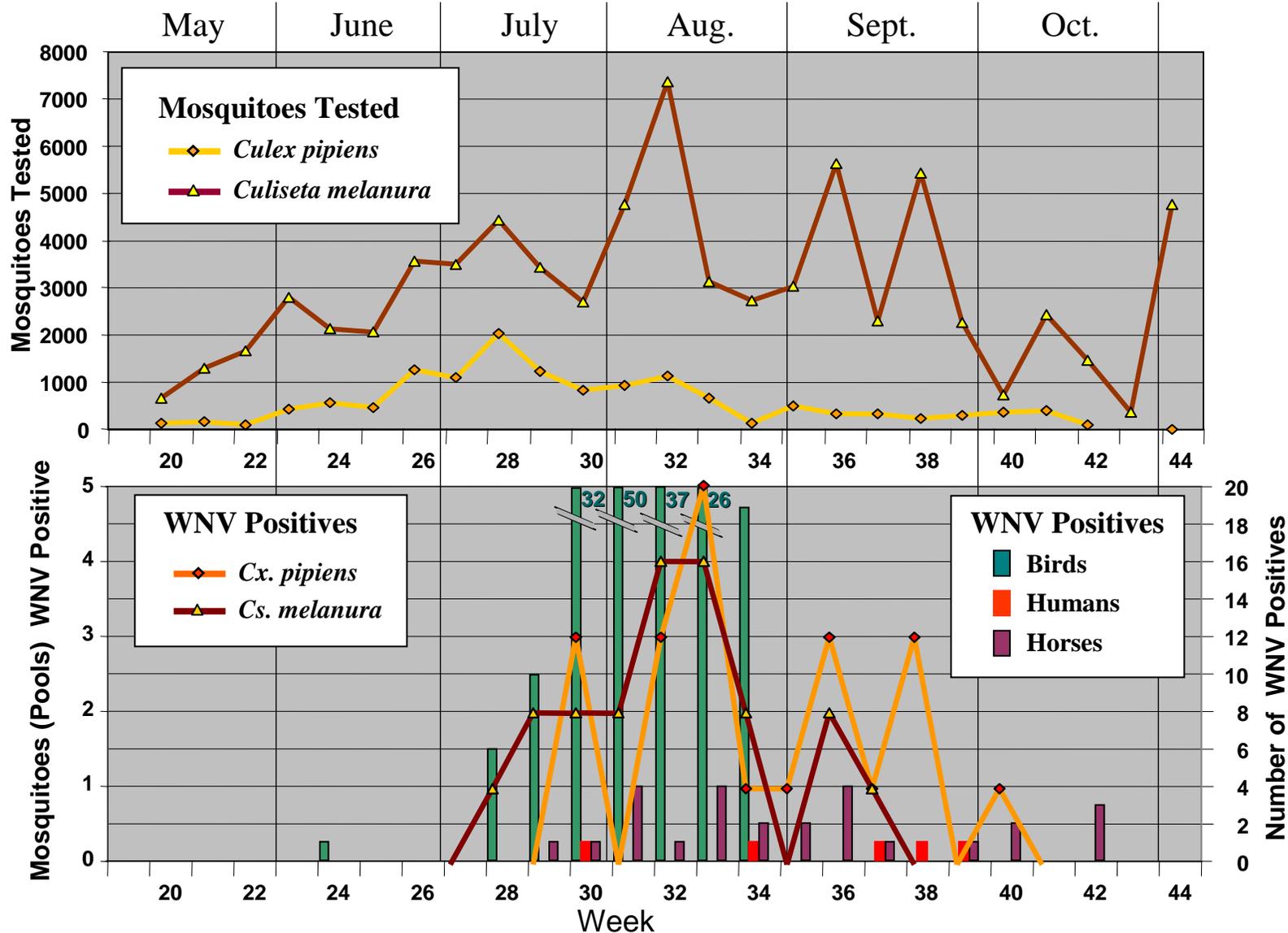
WNV in Birds, Humans and Horses in the Tidewater Region in 2003.



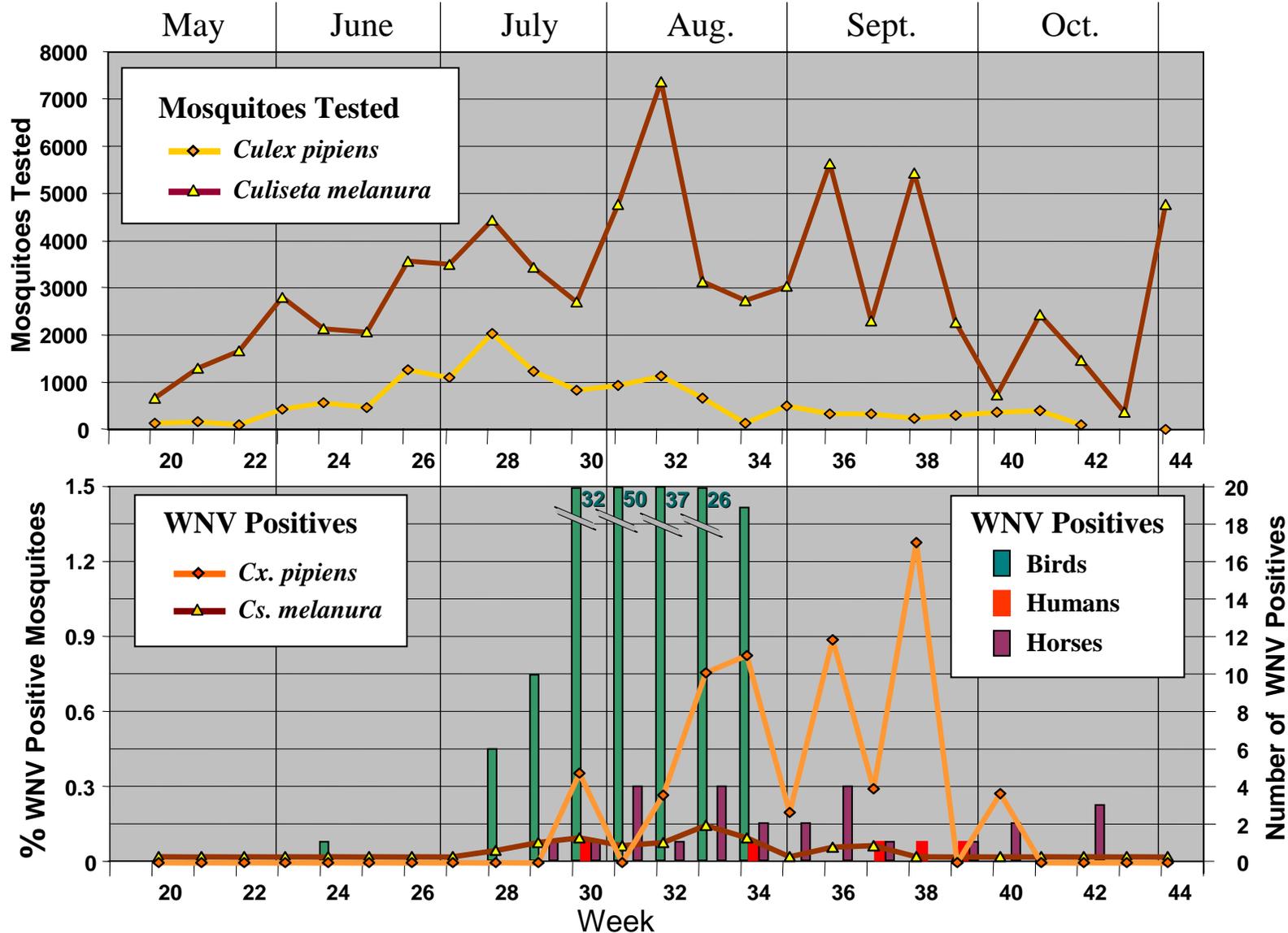
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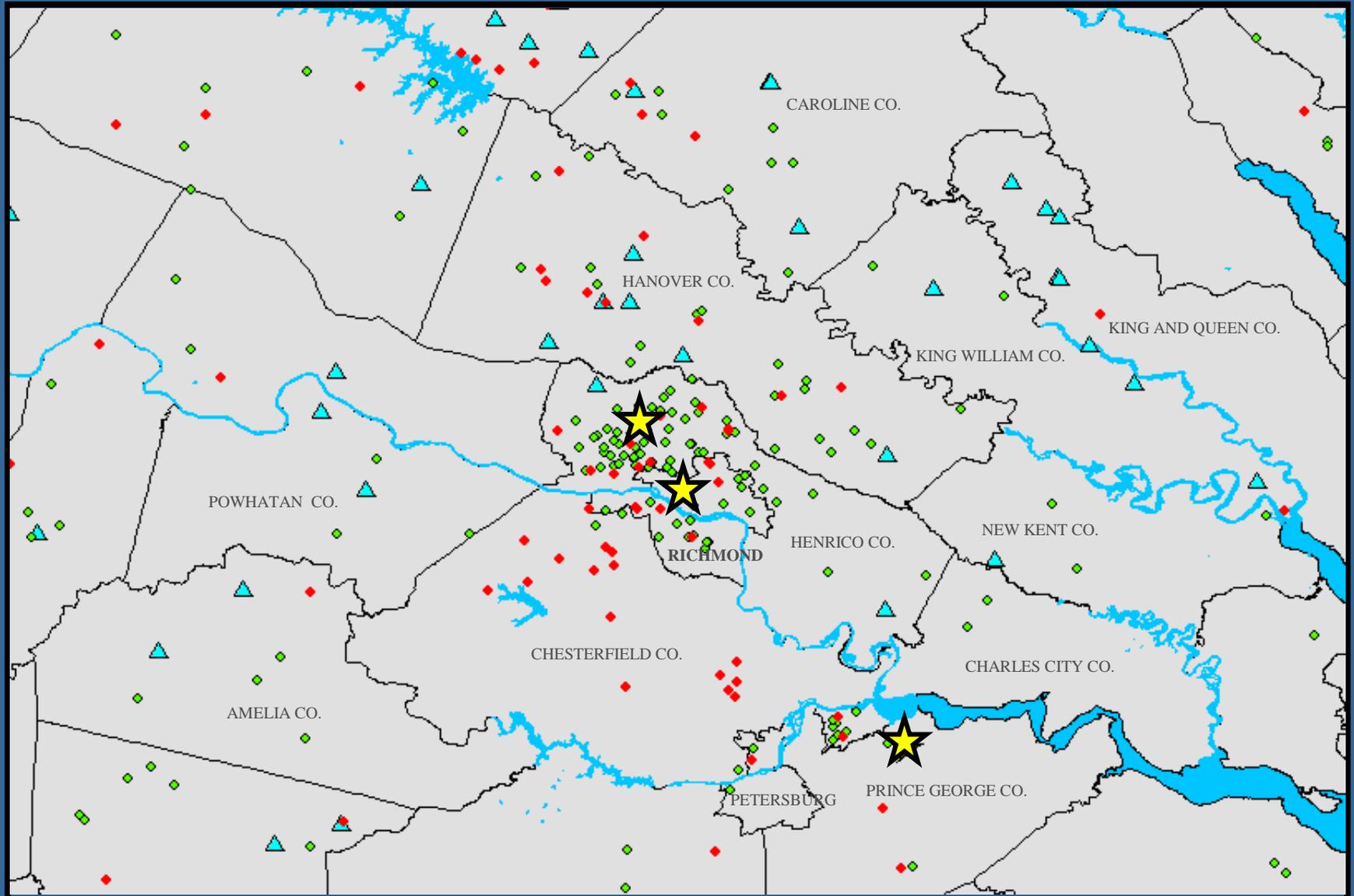
WNV Activity in the Tidewater Area (Hampton, Norfolk, Portsmouth, Chesapeake, Suffolk, Virginia Beach and Isle of Wight Co.) in 2003.



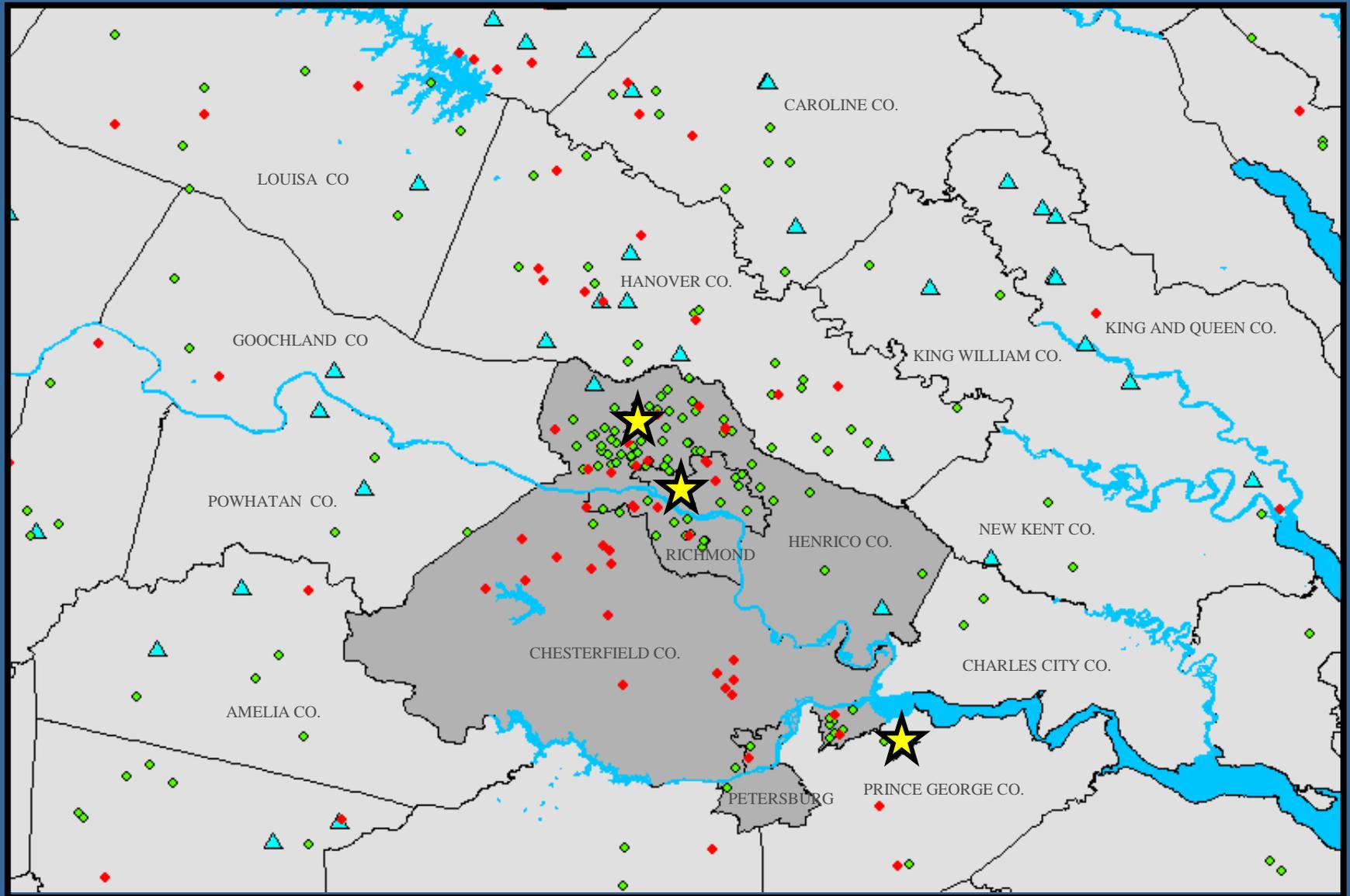
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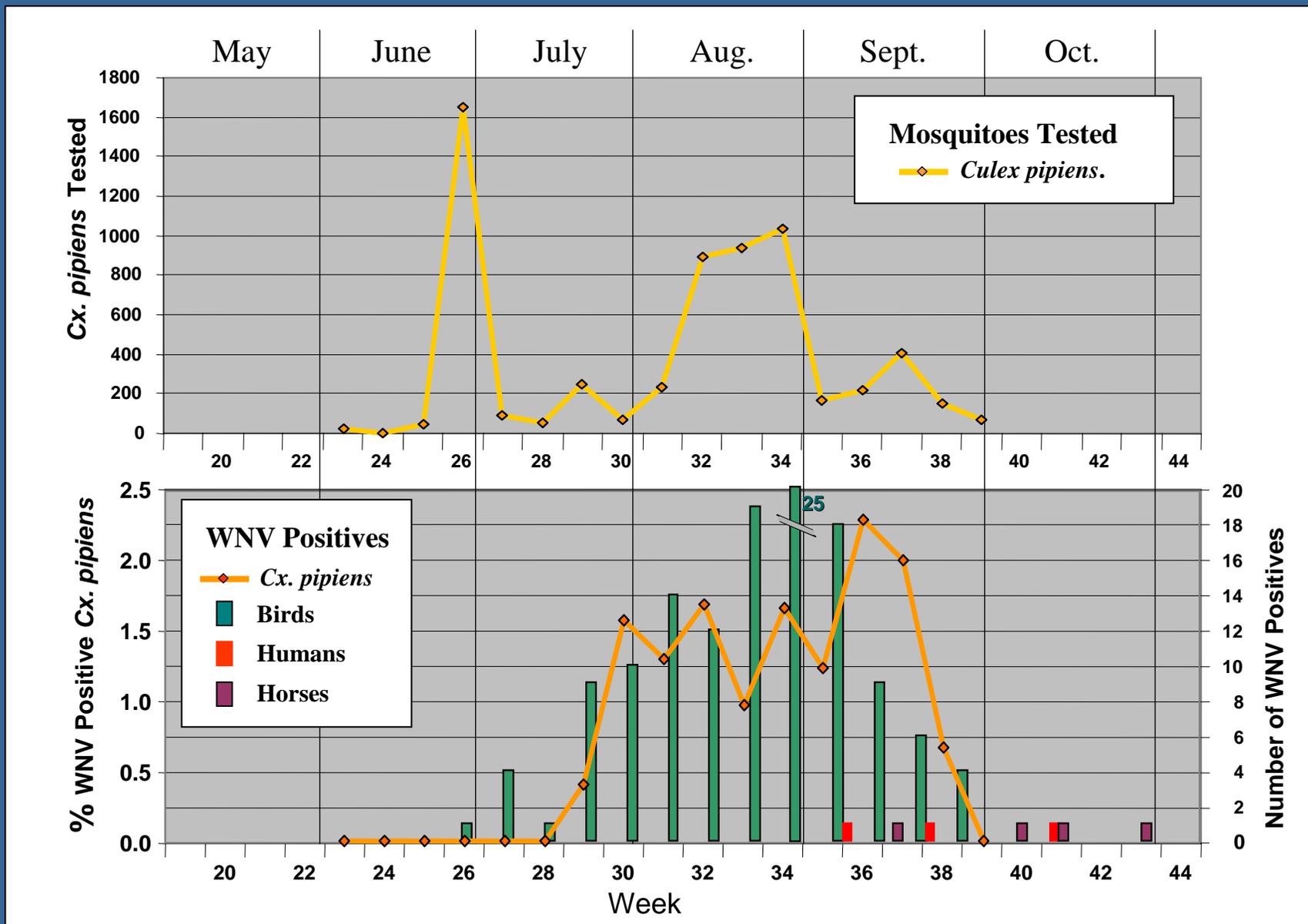
WNV in Birds and Humans in the Richmond Area in 2003.



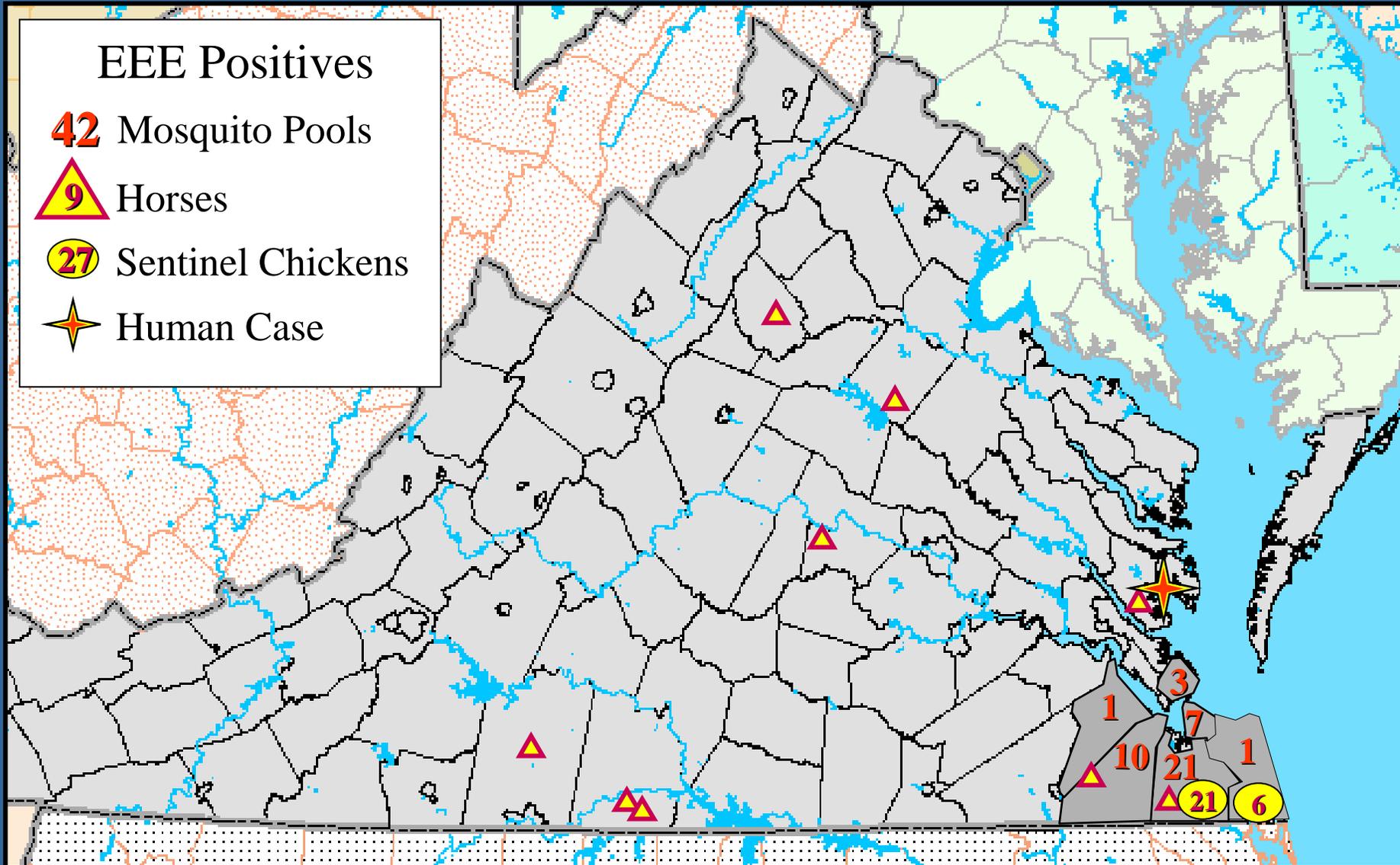
WNV in Birds and Humans in the Richmond Area in 2003.



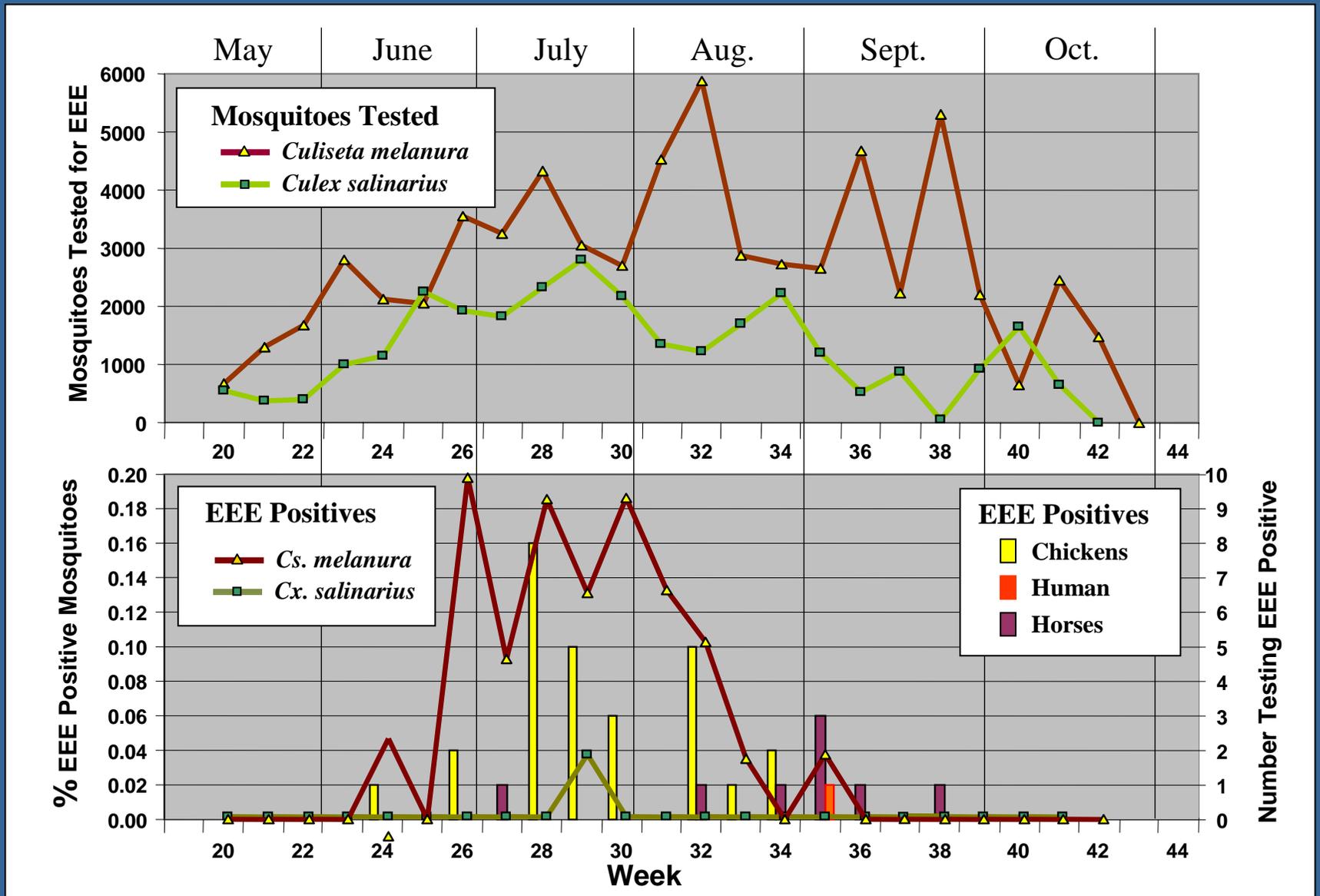
WNV in Birds and Humans in the Richmond Area (Richmond, Petersburg, Hopewell, Colonial Heights, Chesterfield Co., and Henrico Co in 2003.



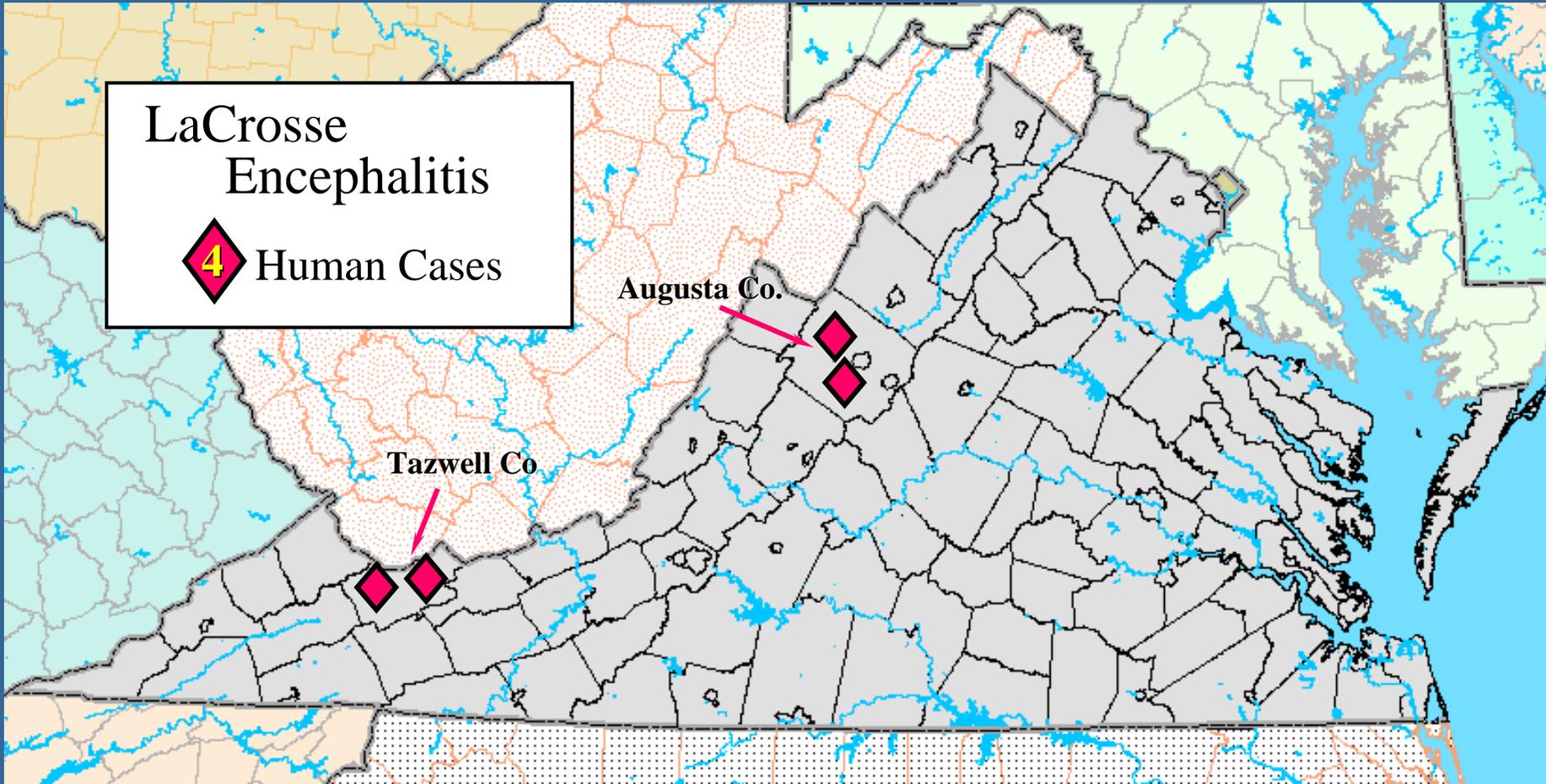
Eastern Equine Encephalitis in Mosquitoes, Horses, Sentinel Birds and Humans in Virginia in 2003.



EEE in Mosquitoes, Horses, Sentinel Birds and Humans in Virginia During 2003.



LaCrosse Encephalitis (LAC) in Virginia in 2003.



LAC Activity in Augusta County, VA is farther east and north of where LAC cases have usually been found.

Conclusions:

1. WNV has not spread across Virginia as quickly as in other more northern states, but the 2003 season showed a dramatic increase in the distribution of WNV over its 2002 distribution
2. Although WNV may be found over large areas of the state, its activity appears to be focal or clustered (localized) in most areas.
3. Urban areas appear to have more intense WNV activity, partly because there are more people to report dead birds, or become sick themselves, but also because urban storm sewer systems and an abundance of containers provide a good breeding ground for *Culex pipiens*.

Conclusions:

4. The early occurrence of WNV infected birds in the 2002 and 2003 seasons indicated localities where there was greater potential for occurrence of human cases.
5. In 2002 and 2003, human cases were more likely to live near where early clusters of WNV infected birds occurred.
6. Human cases rarely occurred where no early birds had been found, but there were many areas where heavy, early WNV activity was seen in birds, but no local human cases occurred.

Conclusions:

7. WNV infected birds are good early indicators of WNV activity, but good mosquito surveillance can also provide a good early warning system.
8. In areas where human cases occurred, bird surveillance indicated WNV activity from 6 to 9 weeks before the first human case and mosquito surveillance indicated WNV activity from 2 to 7 weeks in advance.
9. Human cases typically occurred during, or just after the first big peak (increase) in the number of infected *Cx. pipiens*.

Conclusions:

10. *Culiseta melanura* mosquitoes may serve as a good indicator for WNV activity, but *Cx. pipiens* are a much more sensitive species to monitor because very few have to be tested to yield WNV positives
11. The use of properly baited gravid traps to detect *Culex pipiens* mosquitoes is the most effective method of mosquito surveillance for WNV.
12. WNV infection in horses indicates local WNV activity, but horses do not serve as good sentinels because they usually get WNV at the same time or later in the season than most humans do.

The End